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Polarization measurements of Jovian radio emissions at high-magnetic latitudes observed by Ulysses spacecraft

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In early 2004, the Unified Radio And Plasma wave (URAP) experiment onboard Ulysses measured the Stokes parameters of Jovian kilometric radiations at northern high-latitudes during the "distant encounter" flyby. Ulysses observed from more than +80 deg to less than +10 deg of Jovicentric latitude for several months. The observation indicated that quasi-periodic (QP) bursts and narrowband kilometric emissions (nKOM) have LH polarization (V$\tilde{+}$1). Therefore, we conclude that these emissions are LO mode waves. This is consistent with several previous observations at low-latitudes ($\tilde{0}$ deg) and mid-latitudes ($\simeq$40 deg) (e.g., Daigne and Leblanc, 1986; MacDowall et al., 1993).

On the other hand, it was shown that broadband kilometric radiations (bKOM) have RH polarization (V$\simeq$1) at high-latitudes. This result does not agree with our previous study based on the combination of observed location of bKOM and ray tracing, which showed these emissions as LO mode waves (Kimura et al., 2008). We confirmed by additional ray tracing analyses that a solution can allow LO mode waves to be observed with RH polarization at high-latitudes. This result would constrain generation and propagation processes for Jovian radio components observed at high-latitudes.